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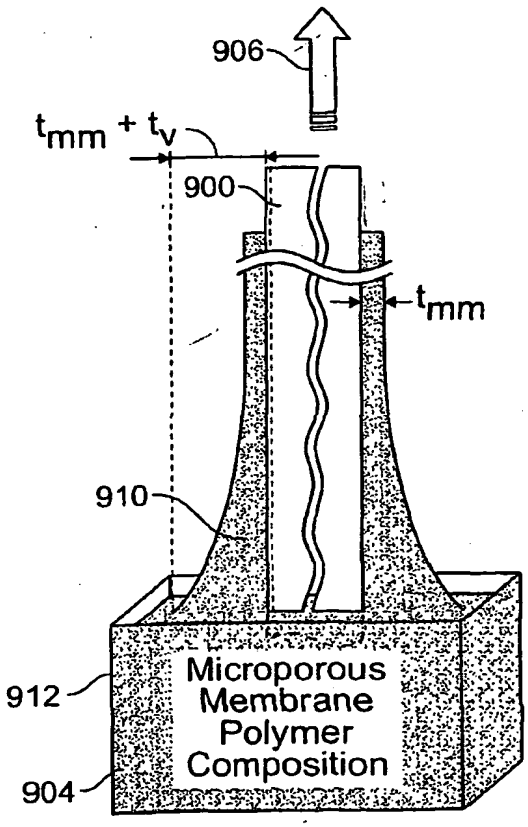
(54) Title: SUBSTRATES FOR ISOLATING, REACTING AND MICROSCOPICALLY ANALYZING MATERIALS



(57) Abstract: An immobilizing device for biological material comprises a rigid support (12) carrying a substrate layer (20, 20') of polymer having biological immobilizing properties, e.g. for amino and nucleic acids. Substantially solid ultra-thin substrate layers (20') having a thickness less than about 5 micron, preferably between about 0.1 and 0.5 micron, and micro-porous, ultra-thin substrate layers (20') having a thickness less than about 5 micron, preferably less than 3 micron, 2 or 1 micron are shown, which may be segmented by isolating moats M. The substrate layer is on a microscope slide (302), round disc (122), bio-cassette, at the bottom of a well of a multiwell plate, and as a coating inside a tube. Fluorescence or luminescence intensity and geometric calibration spots (420) are shown. Reading is enhanced by the intensity calibration spots (420) to enable normalization of readings under uneven illumination conditions, as when reading by dark field, side illumination mode. The reference spots are shown being printed simultaneously with printing an array of biological spots or with the same equipment. Methods of forming layers of the device include controlled drawing from a bath of coating composition and drying, and spinning of C-D shaped substrates. Post-forming treatment is shown by corona treatment and radiation. Adherent metal oxides (14), silica-based materials and other materials are used to unite layers of the composite. In multiwell plates the oxide promotes joining of a bottom plate (95, 95') and upper, well-defining structure (94) of dissimilar material. The oxides (14) also provide beneficial opacity to prevent light entering the glass support, for applying potential to the substrate, etc.

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